

Patent

UNITARY DOUBLE WALLED CONTAINER AND METHOD FOR MAKING
Background of the Invention

Field of the Invention.

This invention relates to the art of single
5 piece containers, and more particularly to thermally
insulated single piece seamless construction containers.
Brief Description of the Prior Art.

When a consumer or user carries a disposable
paper cup or a single walled plastic container containing
10 coffee, tea, or other food products commonly sold and
dispensed, in many instances the temperature of the
contents of the container is such as to create discomfort
in the hands and fingers of the holder. That is,
paperboard and certain plastic cups typically do not
15 inherently provide sufficient thermal insulation or
moisture barrier properties when filled with hot or cold
beverages or other food products. The transfer of
temperature from the liquid or contents through the
container to the holder's hand can cause handling and
20 consumption problems.

To combat these problems, convenience stores
and fast food retail outlets often "double cup" (use a
pair of nested cups) for coffee and other hot drinks.
The outer drink cup and the air gap between the two cups
25 provides a level of thermal insulation for the hot
beverage contained within the inner drink cup. Another

approach employed by some manufacturers of both paper and plastic containers is to provide an integral band of synthetic material that is formed in the manufacturing process to provide an insulative layer. Both of these
5 approaches tend to be expensive.

More recently, a number of persons have designed and provided disposable "sleeves" that slip over the outside surface of a drink cup to provide insulation between the contents of the cup and the hands and fingers
10 of the holder. These sleeves take numerous forms and are commonly made of paper or other insulative materials. One characteristic common to most or all of these sleeves is the fact that they are opaque and, for this reason, obscure the trade dress and ornamental designs which the
15 manufacturers of the hot drink cups take pains to provide.

Another general problem with certain drink cups is that they are constructed with two pieces of plastic that have to be formed and bonded together. More
20 specifically, such two-piece cups are generally formed from a sidewall sheet of thermoformable plastic material whose ends are overlapped somewhat and bonded to one another to form a longitudinal sidewall seam. A bottom disc is then bonded to an annular bottom flange integral
25 with the side wall to form a seal therebetween.

This conventional two-piece cup construction presents the problem of weakening of the lower bottom edge of the cup due to stresses that are induced by the heat and pressures involved in bonding the bottom wall
30 disc to the side wall flange. Weakening of the annular bottom edge of the cup may, in turn, cause it to rupture thereby spilling the cup contents. The possibility of rupturing the bottom edge of the cup is especially acute if the cup is dropped some distance when filled with
35 liquid or other food products.

Because of the foregoing deficiencies in the art, it would especially be desirable if a single piece seamless construction container could be provided which includes an insulative layer coupled to the container in order to protect the holder's hand and fingers from the temperature of the contents therein, and also to minimize (if not eliminate entirely) the stresses at the bottom edge of the cup which are induced by the heat and pressures during the fabrication process. It is toward providing such a container that the present invention is directed.

Summary of the Invention

The present invention relates to a single piece seamless construction container and method of making therein, advantageously configured to provide a sturdy construction and an insulative layer for protecting the holder's hand and fingers from discomfort due to hot or cold temperature transfer through the sidewall of the container. In general, this is achieved by providing a single piece seamless construction container, and preferably two wings coupled with the container, although one or a plurality of wings may be used. The wings are configured to wrap about the container, preferably spaced apart from a surface of the container, and are adapted to form an insulative air gap between the surface of the container and the wing.

The wings preferably comprise a patterned surface such as flutes, dimples, or ridges that are thermoformed into the material in sheet form during the manufacturing process. Other patterns are possible which may include design logos or other indicia. Furthermore, the container and/or the wings may be transparent, allowing for a user to visualize design logos or other indicia located on a surface of the container or a wing, and also to see the contents of the container.

Alternatively, the patterned surface may be thermoformed into the container, allowing the wing to remain smooth. This creates a smooth insulative outer surface for printing of logos and other indicia.

5 As an additional alternative, both the container and the wings may include a patterned surface.

 The container according to the present invention is further uniquely adapted to efficiently nestably stack in either a wing open or wing closed
10 position in order to promote efficient bulk transportation of the containers to wholesale, retail, or other end users. The containers can readily nest without becoming wedged or telescoped together.

 It is a further object of the invention to
15 improve the gripability of a cup or container.

 Yet another object of the invention is to thermally insulate the hand and fingers of a user from the liquid or food product held in a container.

 Yet another object of the invention is to
20 provide a container that has improved strength characteristics over two or more piece construction containers.

Brief Description of the Drawings

 Fig. 1 is a perspective view of a unitary
25 double walled container according to the present invention.

 Fig. 2 is a side elevation view of the unitary double walled container of Fig. 1 in a wing open position.

30 Fig. 3 is a side elevation view of the unitary double walled container of Fig. 2, showing the wings partially folded down.

 Fig. 4 is a side elevation view with a partial section of the container of Fig. 1, showing the
35 insulative wing and air gap.

Fig. 5 is a cross section view taken along line 5-5 of the container of Fig. 4, showing the bottom support configuration and insulative wings in a folded down position.

5 Fig. 6 is a fragmentary cross section view taken along line 6-6 of the container of Fig. 9, showing the hinge detail in a wing open position.

Fig. 7 is a fragmentary view of the hinge detail of Fig. 6, showing the hinge detail in a wing
10 folded down position.

Fig. 8 is a top plan view of a single sheet of thermoformable material, after the vessel has been thermoformed, and after the wings have been cut, but before the wings have been thermoformed.

15 Fig. 9 is a top plan view of the container of Fig. 8, after the wings have been thermoformed.

Description of the Preferred Embodiment

Although the disclosure hereof is detailed and exact to enable those skilled in the art to practice the
20 invention, the physical embodiments herein disclosed merely exemplify the invention that may be embodied in other specific structure. While the preferred embodiment has been described, the details may be changed without departing from the invention, which is defined by the
25 claims.

For instance, it is noted that the unitary double walled container disclosure of the present invention is particularly suited for holding beverages, such as coffee. However, the container of the present
30 invention could easily be modified in form to contain any other foodstuffs. For instance, it is within the scope of the present invention to modify the generally cylindrical structure of the disclosed container to a box or other shaped container, to resemble a pizza box or
35 other hot or cold lunch container.

The seamless construction container as hereinafter described in detail is made of plastic, preferably of PET (polyethylene), [** is PET correct???**] although other suitable materials may be used. Such
5 containers have marked advantages over paper cups that have been impregnated or coated with wax. They present a better feel and taste to the lips, they do not become soggy in use, and they form a substantially perfect vapor barrier so that no moisture condenses on a cool table
10 beneath a cup when the cup contains hot coffee or the like.

Referring now to the drawings, wherein like numerals represent like parts throughout the views, there is generally designated at 10 an ergonomically designed,
15 unitary double walled container according to the present invention. As seen particularly in Figs. 1 and 2, the container 10 includes a vessel portion 12 preferably coupled by way of a hinge or hinges 65 to preferably two winged portions 14, although any number of wings may be
20 used.

The generally cylindrically shaped vessel 12 incorporates a closed bottom 30 and an open top 35. The vessel 12 preferably has a rim or lip 25 at the open top 35 which may be curled over. The rim 25 at the open top
25 35 may be adapted to fit any existing lid or cover (not shown), according to the size of the container 10 and the preference of the purchaser/end-user.

In a preferred embodiment, the vessel 12 includes an upper sidewall portion 15 and a lower
30 sidewall portion 20. The lower sidewall 20 preferably includes a plurality of ribbing 17 in order to provide structural support and strength to the container 10, although other suitable structural support such as ridges or fins may be used. The lower sidewall portion 20 is
35 also preferably adapted for placement in a cup holder,

such as a vehicular cup holder.

As best seen in Figs. 4 and 5, the bottom 30 of the vessel 12 may be formed with a punt or raised main central portion 32 integral with an annular supporting marginal portion 31. The raised main central portion 32 improves the strength of the closed bottom 30.

Attention is now directed to the winged portion 14 as best seen in Figs. 3, 4, and 9. The winged portion 14 comprises an integral thermoformed segment of the container 10, coupled to the vessel 12 by way of a hinge 65 or other conventional coupling means. Preferably, the wing 14 is formed in a manner as to be in surrounding contact with the circumferential upper sidewall portion 15 when wrapped about the vessel 12, as indicated by the directional arrows 90 in Fig. 3. The wing 14 may then be secured about the vessel 12 by fastening means such as a tab 155 and a receiver 160. Alternatively, the wing 14 may also be formed to be in surrounding contact with both the upper sidewall portion 15 and the lower sidewall portion 20.

Although a particular type of end fastening means is disclosed, it will be understood and appreciated by those skilled in the sheet materials art that any of several different end fastening mechanisms, such as tabs and slots, adhesives, or snap buttons may be used. Examples of alternative fastening means can be seen at 55 and 60, and 255 and 260, in Figs. 2 and 8 respectively. Alternatively, the bands may be preformed into sleeves and permanently joined. It is also possible to thermoform seamless sleeves, usually by forming a cup and later removing the bottom.

As can be best seen from Figs. 1 and 4, in a preferred embodiment, a surface pattern 52 is applied to the wings 14, although a surface pattern 52 applied to only the vessel 12, or both the vessel 12 and the wings

14, is within the scope of the invention. The surface pattern 52 serves several purposes. The surface pattern 52 may contact the vessel 12, forming a structural member of the wing 14. Referring to Fig. 4, the surface pattern 52 can also preferably serve to trap air 80 between the outer surface 40 of the vessel 12 and the inner surface 51 of the wing 14, thereby forming an insulating layer. The surface pattern 52 also may assist nestability of the containers 10 in stacked form for shipping. The surface pattern 52 adds rigidity to the wing 14, which in turn provides for additional structural support for the container 10. The surface pattern 52 also serves as a convenient finger grip and contact surface.

The surface pattern 52 may be any pattern, such as a fluted pattern, hemispheres (either raised or depressed), cylindrical rings, geometric figures, slogans or trademarks, or cartoon characters in any combination, depending on manufacturer/purchaser preference.

Referring now to Figs. 6 and 7, the rim 25 of the vessel 12 and the hinge 65 are shown. In a preferred embodiment, a predetermined distance X is greater than a predetermined distance Y. Preferably, distance X is equal to the diameter of the rim. The relationship between distance X and distance Y is important in order to allow the hinge 65, preferably comprising a rim arm 70 and wing arm 72, to be positioned within the space 27 defined by the rim 25. The hinge 65 preferably comes to a point to effectuate the rotation of the hinge 65 into the space 27 under the rim 25. Preferably all but a slight amount of the hinge 65 is formed in the secondary thermoforming operation.

Method of Manufacture

The preferred method of manufacturing the container 10 is multi-progressive thermoforming. Multi-progressive thermoforming is comprised of a series of

thermoforming steps in order to produce the container 10.

However, any material may be used, such as but not limited to, polystyrene, paper, or other materials. Additionally, a polystyrene sleeve could be applied to
5 the outer wall of the inner cup prior to final assembly.

The first step is to pre-form the vessel 12. A flat sheet of pre-heated thermoformable material, such as PET (polyethylene), polystyrene, polycarbonate, nylon, acetate, polyvinyl chloride, saran, etc., is placed over
10 a cavity opening. By choosing the desired sheet material and further selecting the appropriate properties for the selected material, the container can be formed of a material that is tailored to the product end use, i.e. to retaining the contents to be put into the container and
15 to being disposable or recyclable. Next, a vacuum is applied to the tool cavity, sucking the vessel portion 12 of the container 10 down within the cavity in order to define the vessel 12 shape. The lower sidewall support ribbing 17 may also be formed during this first
20 thermoform. The punt 32 integral with the closed bottom 30 is also preferably formed during the first thermoform.

At this point in the manufacturing process, the wings 14 will need to be trimmed out of the flat part of the thermoformable material. A stamping die next
25 stamps out the outline of a wing or wings 14, and the means for coupling the wings 14 together about the vessel 12. At this time, the wings 14 will still be flat, as can be seen in Fig. 8.

The second thermoforming stage is next.
30 Referring now to Fig. 9, this secondary thermoforming stage provides contour to the wings 14, such that the wings 14 advantageously fit about the vessel 12. Preferably, the secondary thermoforming stage also forms the surface patterns 52. Also, preferably, the rim 25
35 and hinge 65 contours are formed during the secondary

thermoforming step.

Also within the second thermoforming stage, contour is preferably provided for the wing 14 coupling mechanism, such as tabs 255 and slots 260.

5 At this stage the container 10 may now be stacked for shipment to wholesalers, retailers, and end users. When the container is ready to be utilized for an intended purpose, the wing or wings 14 are wrapped downward and inward about the vessel 12, as shown by
10 arrows 90 in Fig. 3, wherein the fastening means preferably restrain the wings 14 in a wing 14 closed position. It is also within the scope of the present invention wherein this stage of wrapping the wings 14 about the vessel 12 is completed before the containers 10
15 are stacked for shipment.

 The foregoing is considered as illustrative only of the principles of the invention. Furthermore, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to
20 limit the invention to the exact construction and operation shown and described. While the preferred embodiment has been described, the details may be changed without departing from the invention, which is defined by the claims.